

**PATENT**  
Serial No. 09/898,844  
Attorney Docket: 0444-4083US1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Hessell et. al.      Art Unit : 1764

Application No. : 09/898,844      Examiner : Walter D. Griffin

Filed : July 3, 2001

For: : **COMPOSITIONS OF GROUP II AND/OR GROUP III BASE  
OILS AND ALKYLATED FUSED AND/OR POLYFUSED  
AROMATIC COMPOUNDS.**

**DECLARATION UNDER 37 C.F.R. § 1.132**

Commissioner of Patents and Trademarks  
P.O. Box 1450  
Alexandria, VA 22313-1450

Mail Stop: Amendment

I, Edward T. Hessell declare and state as follows:

1. I received a Bachelor of Science degree in Chemistry in 1984 from the University of Connecticut in Storrs, Connecticut. From 1984 to 1987 I worked as a research chemist for Ciba Geigy Corp. Thereafter, I was awarded a Ph.D. in Chemistry in 1991 from the University of Rochester in Rochester, New York. Upon receiving my doctorate, I was employed for three years as a Senior Chemist for Texaco Inc. specializing in research and development for additives in motor oils.
2. From 1994 to date, I have been employed by King Industries Specialty Chemicals in Norwalk, Connecticut. I was a Senior Research Chemist, Research and Development Manager for Lubricant Additives, and was promoted to Manager for Specialty Markets in the Research and Development Division in 2002.

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3. I am a co-Inventor of U.S. Patent Application 09/898,844 and submit this declaration in support thereof.

I. **PERFORMANCE TESTS DEMONSTRATE SURPRISINGLY SUPERIOR LUBRICATING QUALITIES**

1. I have acquired two petroleum compositions that were obtained by a fractionation process and are representative of the oil compositions disclosed in the Moore reference.

2. Under my direction an experiment was conducted to compare the lubricating properties of the compositions of the present invention with that of Moore. The procedures of Examples 1, 2, and 4 of the present application were followed. The procedure for the two petroleum compositions were in accordance with Examples 1 and 2 of Moore et al. The kinematic viscosity and pour point characteristics of the five samples are as follows:

Lubricating Property	Claimed Invention (App. 09/898,844, table 3)			Moore et. al.	
	Example 1	Example 2	Example 4	Example 1	Example 2
Kinematic Viscosity at 100° C	7.4	4.6	8.0	26.7	16.4
Kinematic Viscosity at 40° C	44.9	51.2	56.0	n/a	453
Pour Point	-21° C	-24° C	-21° C	13° C	12° C

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3. The results show that the combination of the alkylated naphthalene compounds with the Group III base oils disclosed and claimed in the present invention provided superior lubricating properties compared to the fractionated oil compositions described and claimed in Moore. The kinematic viscosities at 40° C and 100° C are far lower and the pour point temperature is far lower than those of the Moore et al. compositions. This is surprising and unexpected.

## II. CARCINOGENICITY

1. Generally, it is known in the trade that the determination of carcinogenic potential in an oil can be measured using the Institute of Petroleum's "IP-346" test. IP-346 is a measure of the percent content of polycyclic aromatic hydrocarbon (PAH) compounds in an oil by extracting a sample with a DMSO solvent. Oils with a PAH content of more than three percent have been shown to cause cancer in animal tests. On the other hand, compounds that contain less than three percent PAH content are considered to be non-carcinogenic.

2. The "NA-LUBE" KR series of oils are examples of commercial embodiments of the alkylated naphthalene additive claimed in the present application. I am familiar with the "NA-LUBE" KR series of oils, the composition of which are presented in the following table:

Component	KR-012	KR-015	KR-007A	KR-007	KR-010	KR-019
Monododecyl naphthalene	15	5	75	56.25	22.5	0
Monotetradecyl naphthalene	0	0	0	1	0	4
Didodecyl naphthalene	38	45	25	18.75	40	0
Ditetradecyl naphthalene	40	40	0	4.25	30	17
Tridodecyl naphthalene	7	10	0	0	7.5	0
Tritetradecyl naphthalene	0	0	0	9.25	0	37
Tetratetradecyl naphthalene	0	0	0	6.5	0	26
Pentatetradecyl naphthalene	0	0	0	4	0	16
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

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3. At my direction, samples of NA-LUBE KR-015, NA-LUBE KR-019 and Moore, et. al. comparable Example 1 were sent to Analytical Testing Services in Franklin, PA to undergo an IP-346 test. The results are shown in EXHIBITS A and B. The reports show that KR-015 contained only 0.86% PAH's and KR-019 contained only 0.3% PAH, while the comparative petroleum refined aromatic base oil contained 19.3% PAH. Based on the results obtained, NA-LUBE KR-015 and KR-019 are not carcinogenic whereas the comparative petroleum based aromatic oil is carcinogenic.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

Date: 12/16/2004

  
Edward T. Hessel, Ph.D.

# Analytical Testing Services

An Independent Laboratory

191 Howard Street  
PO Box 61  
Franklin, PA 16323-0061  
(814) 432-7214  
Fax: (814) 432-9424  
e-mail: [info@WeTestIT.com](mailto:info@WeTestIT.com)

August 16, 2004



Michel Hourani  
King Industries, Inc  
Science Road  
PO Box 588  
Norwalk, CT 06852

Dear Michel,

The following are the results from the sample you submitted

**METHODOLOGY:** IP346, "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions – Dimethyl sulphoxide extraction refractive index method".

**ATS Lab ID:** 25922

**King Industries ID:** NA-LUBE®KR-015; Lot #: 3C142

**RESULTS:**

The PCA extract, IP346, is 0.86% m/m with a refractive index of 1.4930

Thank you for the opportunity to be of service to you, and if we can assist you in the future, please feel free to contact us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard M. Eakin".

Richard M. Eakin, President

Reference: Final Report and Invoice #3038 [PO#verbal] Emailed to  
Michel Hourani at [mhourani@kingindustries.com](mailto:mhourani@kingindustries.com) 8-16-2004

Since services are based on sample and information supplied by others, these services are rendered without any warranty or liability.  
Sample will be retained for thirty (30) days.

# Analytical Testing Services

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e-mail: [info@WeTestIT.com](mailto:info@WeTestIT.com)

December 7, 2004

Ed Hessel  
King Industries, Inc  
Science Road  
PO Box 588  
Norwalk, CT 06852

Dear Ed:

The following are the results from the 2-samples you submitted

**METHODOLOGY:** IP346, "Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions – Dimethyl sulphoxide extraction refractive index method".

**ATS Lab ID:** 28085  
**King Industries ID:** 725-123A Synthetic Aromatic

**RESULT:**

The PCA extract, IP346, is 0.3% m/m with a refractive index of 1.507

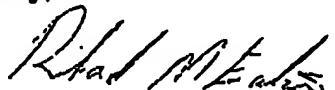
**ATS Lab ID:** 28086  
**King Industries ID:** 725-123B Petroleum Based Aromatic

**RESULT:**

The PCA extract, IP346, is 19.3% m/m with a refractive index of 1.535

Thank you for the opportunity to be of service to you, and if we can assist you in the future, please feel free to contact us.

Sincerely,



Richard M. Eakin, President

Reference: Final Report and Invoice #3193 [PO#86825] Emailed to  
Ed Hessel at [ehessel@kingindustriest.com](mailto:ehessel@kingindustriest.com) 12-07-2004